

SPECIES OF ICHNANTHUS IN SOUTH AMERICA RELATED
TO I. ICHNODES (GRISEB.) HITCHC. & CHASE

Jason R. Swallen

There have accumulated through the years at the U. S. National Herbarium a number of specimens of Ichnanthus which have seemed to belong to I. ichnodes, and have been so named with reservations that some of them might represent distinct species. These have been reviewed in the past several months, with the result that 10 new species are described below. In every species the fruit has small inconspicuous wings about 1/4 or 1/5 the length of the spikelets. Other characters, such as the size of the plant, the form of the panicle and the size of the spikelets, size of the blades, and the pubescence, make a very diverse group of species. None of them can be identified with I. ichnodes of Trinidad which is a large plant with relatively small spikelets. Some may turn out to be extremes of species when sufficient exploration has been done and enough material is available for examination. The current study will form the basis for any future work.

Sheaths densely pilose with spreading yellowish hairs 5-8 mm. long. Spikelets 2.8-3 mm. long.....1. I. villosissimus

Sheaths glabrous or pilose, but not with long yellowish hairs. Blades 10-25 cm. long.

Spikelets 4.5 mm. long.....2. I. amplus
Spikelets not more than 3.9 mm. long.

Culms tufted, erect.

Blades, or at least the longer ones, conspicuously narrowed toward the base.

Blades densely velvety-pubescent.

3. I. vestitus

Blades glabrous or nearly so.

4. I. erectus

Blades rounded at the base. Sheaths papillose-pilose.....5. I. vimineus

Culms decumbent-spreading.

Blades with conspicuous white margins, densely velvety.....6. I. indutus

Blades without white margins, not velvety.

Spikelets 2.9-3 mm. long.

First glume nearly as long as the spikelet; blades lanceolate...7. I. lutzburgii

First glume definitely shorter than the spikelet; blades strongly elliptic-lanceolate.....8. I. pallidus

Spikelets 3.5-3.9 mm. long..9. I. acuminatus

Blades, or at least some of them, more than 25 cm. long.

Plants decumbent or clambering.

- Sheaths conspicuously papillose-hirsute; blades 1.5-2 cm. wide.....10. I. hispidus
- Sheaths glabrous or nearly so; blades mostly more than 3 cm. wide, at least on the lower part of the plant. Blades narrowed below into a petiole-like base; sheaths distinctly auriculate.....11. I. auriculatus
- Blades not petiolate; sheaths not auriculate. Panicle large, as broad as long; spikelets 3-3.5 mm. long.....12. I. silvestris
- Panicle 2-3 times as long as broad; spikelets 3.5-4 mm. long.....13. I. chaseae

1. *ICHNANTHUS VILLOSISSIMUS* Swallen, sp. nov.

Culmi basi decumbentes internodiis multis 2-4 cm. longis; vaginae internodiis longiores, papilloso-pilosae pilis luteis 5-8 mm. longis; laminae 15-19 cm. longae, 2.5-3 cm. latae, dense pilosae; paniculae 30-45 cm. longae; spiculae 2.8-3 mm. longae; gluma prima spicula 1/2-1/3 brevior; fructus 2.4 mm. longus alis 0.4 mm. longis.

Perennial; culms decumbent at the base with numerous short internodes 2-4 cm. long, completely covered with overlapping sheaths, these densely papillose-villous with spreading yellowish hairs 5-8 mm. long; blades 15-19 cm. long, 2.5-3 cm. wide, somewhat asymmetrical, softly and densely pilose with hairs about 0.5 mm. long; panicles 30-45 cm. long, with 5 or 6 whorls of ascending branches, the lower ones as much as 20 cm. long; spikelets 2.8-3 mm. long, the first glume acute, 1/2-2/3 as long, scabrous over the back, and sometimes with a few long hairs; second glume and sterile lemma equal, blunt, smooth or somewhat scabrous; fruit 2.4 mm. long, yellowish, the wings small, about 0.4 mm. long.

Type in the U. S. National Herbarium, No. 1255849, collected on steep brushy banks about 2000 ft., La Merced, Peru, August 10-14, 1929, by J. Francis Macbride (No. 5535).

Although sterile, a specimen collected by A. S. Hitchcock (No. 22128), at Colonia Perené, Junín, Peru, undoubtedly belongs to this species.

2. *ICHNANTHUS AMPLUS* Swallen, sp. nov.

Culmi decumbentes, 1.4 m. longi; vaginae internodiis longiores, glabrae vel marginibus ciliatae; laminae 14-22 cm. longae, 15-17 mm. latae, acuminatae; panicula 40 cm. longa, 25 cm. lata, ramis patentibus 13-15 cm. longis; spiculae 4.5 mm. longae; gluma prima acuta spicula 1/5 brevior; fructus 3 mm. longus alis 0.6 mm. longis.

Perennial; culms spreading, 1.4 m. long, sparsely pubescent at the nodes or glabrous; sheaths longer than the internodes, becoming longer upward, glabrous or with ciliate margins; ligule membranaceous, about 1 mm. long, some lacerate or ciliate; blades 14-22 cm. long, 15-17 mm. wide, attenuate, scabrous on the margins, and with a few long hairs at the base; panicle about 40 cm. long, 25 cm. wide, the branches spreading, the

longest about 13-15 cm. long, mostly naked at the base; spikelets 4.5 mm. long, the first glume acute, 0.5-0.8 mm. shorter, scabrous on the keel; second glume and sterile lemma equal, acute, the glume somewhat scabrous toward the summit; fruit 3 mm. long, pale lead-colored, the wings 0.6 mm. long.

Type in the U. S. National Herbarium, No. 1613273, collected in brushy borders, Campo Salles to Crato, Ceará, Brazil, April 13-15, 1934, by Jason R. Swallen (No. 4332).

3. *ICHNANTHUS VESTITUS* Swallen, sp. nov.

Culmi caespitosi, erecti ca. 60 cm. alti; vaginae dense pubescentes, villosae vel glabratae; laminae 13-15 cm. longae, 10-17 mm. latae, acuminatae, dense pubescentes; panícula 22 cm. longa, ramis adscendentibus usque ad 13 cm. longis; spiculae 3.2-3.5 mm. longae; gluma prima spicula $1/3$ brevior pilis paucis longis praedita; fructus 2.6 mm. longus, alis ca. 0.4 mm. longis.

Perennial; culms tufted, stiffly erect, about 60 cm. tall; sheaths rather closely overlapping, somewhat narrower toward the summit, softly and densely pubescent or villous to glabrate; blades 13-15 cm. long, 10-17 mm. wide, the lower ones on the lateral shoots smaller, acuminate, gradually narrowed toward the base, velvety pubescent; inflorescence 22 cm. long, with widely spreading or ascending branches as much as 13 cm. long, densely pilose in the axils; spikelets 3.2-3.5 mm. long; first glume mostly about $2/3$ as long as the spikelet, but ranging from half as long to nearly as long as the spikelet, scabrous on the keel and usually with a few long hairs; second glume and sterile lemma subequal, blunt, with or without a few hairs; fruit 2.6 mm. long, white, the wings small, about 0.4 mm. long.

Type in the U. S. National Herbarium, No. 2182903, collected around dry ledges of Chimantá-tepui, Bolívar, Venezuela, altitude 1700 meters, May 21, 1953, by Julian A. Steyermark (No. 75533).

This species was also collected on Cerro Bolívar by Bassett Maguire (No. 32671).

4. *ICHNANTHUS ERECTUS* Swallen, sp. nov.

Culmi erecti 70-85 cm. alti glabri; laminae 16-22 cm. longae, 1 cm. latae, acuminatae, pilis paucis base praeditae; paniculae 17-21 cm. longae, 4-7 cm. latae, ramis adscendentibus usque ad 8 cm. longis; spiculae 3.8-4.2 mm. longae, glabrae, appressae; gluma prima spiculam aequans; fructus 3 mm. longus alis 0.8 mm. longis.

Perennial; culms tufted, erect, 70-85 cm. tall, glabrous; sheaths usually slightly longer than the internodes, glabrous, with a line of hairs on the margin and a pubescent collar; ligule about 1 mm. long, membranaceous, ciliate, the hairs about 1 mm. long; blades 16-22 cm. long, 1 cm. wide, subattenuate or acuminate, gradually narrowed to the base, the lower ones smaller, with white scabrous margins and a few long hairs near the base, otherwise glabrous; panicle 17-21 cm. long, 4-7 cm. wide, with ascending branches as much as 8 cm. long;

spikelets 3.8-4.2 mm. long, glabrous, the pedicels appressed; first glume as long as the spikelet or sometimes a little shorter, broad, acute or sometimes short-awned; second glume and sterile lemma equal, acute, similar; fruit 3 mm. long, the wings 0.8 mm. long.

Type in the U. S. National Herbarium, No. 1613193, collected in brushy borders Campo Salles to Crato, Ceará, Brazil, April 13-15, 1934, by Jason R. Swallen (No. 4322).

5. *ICHNANTHUS VIMINEUS* Swallen, sp. nov.

Culmi erecti 130 cm. alti; vaginae papillosae; laminae 11-15 cm. longae, 1-1.5 cm. latae, papillosae vel papilloso-hispidae; panícula 25 cm. longa ramis adscendentibus usque ad 12 cm. longis; spiculae 2.8-2.9 mm. longae; gluma prima spiculam subaequans; fructus 2.4 mm. longus alis 0.4 mm. longis.

Perennial; culms erect, 130 cm. tall, the nodes appressed-pubescent; sheaths much longer than the internodes, more or less papillose, papillose-ciliate on the margins, the hairs yellowish; blades 11-15 cm. long, 1-1.5 cm. wide, smaller toward the base of the culm, acuminate, very firm, papillose or papilloso-hispid, especially on the collar; panicle about 25 cm. long, 10 cm. wide, with rather stiffly ascending branches as much as 12 cm. long; spikelets 2.8-2.9 mm. long, the first glume almost as long, scabrous, especially on the keel; second glume and sterile lemma blunt, equal, scabrous at the tips; fruit 2.4 mm. long, yellowish-brown, the wings small, about 0.4 mm. long.

Type in the U. S. National Herbarium, No. 2238117, collected on "ilhas de mata e campo misturados, beira de estrada até Viana," Porto Velho, Territory of Guaporé, Brazil, May 27, 1952, by G. A. Black & E. Cordeiro (No. 52-14560). Also collected at Porto Velho by E. Cordeiro & J. F. da Silva (No. 247).

6. *ICHNANTHUS INDUTUS* Swallen, sp. nov.

Culmi graciles basi decumbentes ca. 60 cm. longi, papilloso-pilosi; vaginae internodiis longiores, pilosae, marginibus dense papilloso-pilosae; laminae 8-13 cm. longae, 8-14 mm. latae, dense pubescentes; paniculae 12-15 cm. longae, ramis adscendentibus solitariis usque ad 6 cm. longis; spiculae 3.5-4 mm. longae; gluma prima spiculam subaequans, 5-nervis, pilis paucis praedita; fructus 2.5 mm. longus alis 0.4 mm. longis.

Perennial; culms slender, hard and woody, decumbent at the base, about 60 cm. long, composed of about 10 internodes, papillose-pilose, especially below the nodes; sheaths mostly longer than the internodes, pilose, densely papillose-pilose along the margins, densely pubescent or villous on the collar; blades lanceolate or more or less ovate-lanceolate, 8-13 cm. long, 8-14 mm. wide, softly and densely pubescent on both surfaces, with rather conspicuous white finely scabrous margins; panicles 12-15 cm. long, with solitary ascending branches as much as 6 cm. long; spikelets 3.5-4 mm. long; first glume nearly as long as the spikelet, 5-nerved, very scabrous on the keel,

sometimes with a few hairs along the margins; second glume and sterile lemma equal, scabrous toward the tip, with a few scattered hairs; fruit 2.5 mm. long with well developed wings 0.4 mm. long.

Type in the U. S. National Herbarium, No. 1255815, collected in brush on clay slope, Campo Santo to the sea, Baía, Baía, Brazil, by Agnes Chase (No. 8046).

7. *ICHNANTHUS LUTZELBURGII* Mez, Bot. Jahrb. Engler 56: 9. 1921.

The following specimens have been referred to this species: Brazil: Parahyba: Pedras de Fogo, Pickel 1724. Pernambuco: Garanhuns, Chase 7792, 7832. Tapera, Pickel 1363, 2439. Piauí: Vão de Faria, Lutzburg 5540. Ceará: Campo Grande, Swallen 4585. Maranhão: Barra do Corda to Grajahú, Swallen 3635, 3636. Goiás: Goiabeira, Chase 11500-I.

8. *ICHNANTHUS PALLIDUS* Swallen, sp. nov.

Culmi decumbentes 80-90 cm. longi nodis pubescentibus; vaginae internodiis longiores, pilosae vel hispidae, marginibus papilloso-hispidae pilis 2 mm. longis; laminae 16-25 cm. longae, 15-23 mm. latae, basi pilis longis praeditae; panícula ca. 30 cm. longa, 5 cm. lata, ramis adscendentibus usque ad 14 cm. longis; spiculae 3 mm. longae; gluma prima spicula 1/6-1/5 brevior; fructus 2.3-2.4 mm. longus alis 0.5 mm. longis.

Perennial; culms decumbent, 80-90 cm. long, the lower 15 cm. covered with much overlapping sheaths, the nodes pubescent; sheaths all longer than the internodes, variously pilose or hispid, with a prominent line of papillose hairs on the margins about 2 mm. long; blades 16-25 cm. long, 15-23 mm. wide, acuminate, gradually narrowed toward the base to the width of the sheath, sometimes sparsely papillose-hispid on the upper surface, with a fringe of long, papillose hairs near the base; panicle about 30 cm. long, 5 cm. wide, with narrowly ascending branches as much as 14 cm. long; spikelets 3 mm. long; first glume 3-nerved, 4/5-5/6 as long as the spikelet, scabrous on the keel; second glume and sterile lemma equal, blunt, scabrous toward the tip; fruit 2.3-2.4 mm. long with wings 0.5 mm. long.

Type in the U. S. National Herbarium, No. 1763244, collected in patch of forest in scrub savanna, at Yupukari, basin of Rupununi River, British Guiana, October 15, 1937, by A. C. Smith (No. 2263).

9. *ICHNANTHUS ACUMINATUS* Swallen, Fieldiana 28: 28. 1951.

The following specimens are referable to this species, although they vary somewhat from the type. The main difference is in the size of the leaves, which may be as little as 10 cm. long and 1 cm. wide, or as much as 35 cm. long and 3.5 cm. wide.

Colombia: Santander: Mesa da los Santos, Killip & Smith 12218.

Venezuela: Bolívar: 105 km. from El Dorado to St. Elena, Foldats 2779; Gran Sabana between Mission of Santa Teresita de Kavanayén to Río Karuai, Steyermark 59371; between Santa Teresita de Kavanayén and base of Ptari-tepui, Steyermark 60335;

between Kun and Uaduarapara in Valley of Río Kukenán, Steyermark 59086 (type); al pié del oro Ceitá, Gran Sabana, Tamayo 2929. Sucre: En sitios de Las Altas, Tamayo 2131. Carabobo: Bejuma road, Box 3886, 3887. Aragua: Mountains north of Maracay, Box 3947.

British Guiana: Kaieteur Savanna, Jenman 902; Sandwith 1289. Orinduik Falls, Ireng River, Harrison 1461; Imbaimadai, Maguire & Fanshawe 32264.

Brazil: Ceará: Campo Grande, Swallen 4523. Pará: Pires & Silva 4259.

10. *ICHNANTHUS HISPIDUS* Swallen, sp. nov.

Culmi radicales 1 m. longi nodis villosis; vaginae internodiis multo longiores dense papilloso-hirsutae; laminae 20-30 cm. longae, 1.5-2 cm. latae, acuminatae, papilloso-hispidae; panícula 25 cm. longa ramis usque ad 12 cm. longis; spiculae 3.8 mm. longae; gluma prima spicula $1/5$ brevior; fructus 2.8 mm. longus alis 0.4-0.5 mm. longis.

Perennial?; culms straggling, 1 m. or more long, white-villous at the nodes and for a short distance below; sheaths all much longer than the internodes, rather densely papilloso-hirsute with spreading hairs about 5 mm. long; blades about 20-30 cm. long, 1.5-2 cm. wide, acuminate, papilloso-hispid on both surfaces, especially toward the base; panicle 25 cm. long, with ascending branches arranged in 5 or more whorls, as much as 10-12 cm. long; spikelets 3.8 mm. long, the first glume $4/5$ as long to nearly as long as the spikelet, scabrous on the keel and nerves, occasionally with a few long hairs; second glume and sterile lemma equal, blunt, more or less scabrous at the tip; fruit 2.8 mm. long, the wings small, 0.4-0.5 mm. long.

Type in the U. S. National Herbarium, Nos. 2182142 and 2182143, collected on Cerro Altamira, 10 km. east of Ciudad Piar, 425-650 m. altitude, State of Bolívar, Venezuela, October 19, 1953, by Bassett Maguire, John J. Wurdack & George S. Bunting (No. 35877). Also collected on river banks of Río Tirica, Caroní, Guayana, Venezuela, by F. Cardona (No. 2231).

11. *ICHNANTHUS AURICULATUS* Swallen, sp. nov.

Culmi erecti 2.3 m. alti, pilosi, nodis pubescentibus; vaginae internodiis breviores, glabrae, auriculatae; laminae 28-37 cm. longae, 3.5-5 cm. latae, acuminatae, prope basin petiolatae, infra et supra pilosae; panícula 55 cm. longa ramis adscendentibus vel patentibus usque ad 20 cm. longis; spiculae 3.6-3.8 (4.0) mm. longae; gluma prima spicula $1/3$ brevior; fructus 2.6 mm. longus alis 0.5 mm. longis.

Perennial; culms erect, 2.3 m. tall, more or less pilose with pubescent nodes; sheaths shorter than the internodes, glabrous, with prominent auricles up to 8 mm. long, and densely villous collar; blades 28-37 cm. long, 3.5-5 cm. wide, acuminate, gradually narrowed to a petiole-like base, pilose on both surfaces, the petiole densely hispid with hairs about 4 mm. long, the margins finely scabrous; panicle 55 cm. long, with narrowly ascending to spreading branches as much as 20 cm. long, pubes-

cent to pilose at the base, and with a few long hairs intermixed; spikelets 3.6-3.8 mm. long, rarely to 4 mm.; first glume $2/3$ as long as the spikelet, scabrous on the keel near the summit, otherwise glabrous; second glume and sterile lemma equal, acute, glabrous; fruit 2.6 mm. long, the wings 0.5 mm. long.

Type in the U. S. National Herbarium, No. 1448867, collected among brush, wooded slope, between Itabira and Goiabeira, from Annapolis and Goias, Goias, Brazil, altitude 1000 m., March 22, 1930, by Agnes Chase (No. 11488).

Additional material examined: Brazil: Goias: Vicinity of Goiabeira, Chase 11500-II, 11504. Minas Gerais: Between Uberlandia and Rio Paranahyba, Chase 12107.

12. ICHNANTHUS SILVESTRIS Swallen, sp. nov.

Culmi basi decumbentes, 180 cm. longi, glabri; laminae 28-32 cm. longae, 18-33 mm. latae, glabrae; panícula 32 cm. longa ramis usque ad 18 cm. longis; spiculae 3.3-3.5 mm. longae; gluma prima spicula $1/3$ brevior, pilis paucis praedita; fructus 2.6-2.8 mm. longus alis 0.5 mm. longis.

Perennial; culms rather coarse, decumbent at the base, 180 cm. long, glabrous; blades mostly 28-32 cm. long, 18-33 mm. wide, glabrous, the margins scabrous; sheaths a little longer than the internodes, glabrous on the back, the margins pilose-ciliate, the collar shortly pubescent; panicles 32 cm. long, nearly as wide, pyramidal, the branches in 4 or more fascicles as much as 18 cm. long, pilose in the axils; spikelets 3.3-3.5 mm. long; first glume triangular, about $2/3$ as long as the spikelet, with a few scattered hairs along the scabrous keel and on the margins; second glume and sterile lemma subequal, blunt, glabrous or usually with a few scattered hairs on the keel and margins; fruit 2.6-2.8 mm. long, obscurely yellowish, the wings 0.5 mm. long.

Type in the U. S. National Herbarium, Nos. 1614126 and 1614125, collected in sandy forest, Japanese concession, 35 km. north of Monte Alegre, Pará, Brazil, January 28, 1934, by Jason R. Swallen (No. 3418).

Although there is some difference in the length of the panicle and in the general aspect, the following specimens seem to belong to this species: Brazil: Pará: Aramanahy, Rio Tapajos, Swallen 3225; Obidos, Swallen 5079; João Coelho-Vigia, Black 52-14175; Rio Arapiuns, Pires & Silva 4240. Territory of Amapá: Macapá, Black & Froes 51-12284; Rio Araguari, down river from Porto Platón, Pires, Rodriguez & Irvine 51006.

13. ICHNANTHUS CHASEAE Swallen, Contr. U. S. Nat. Herb. 29: 271. 1949.

This species is very closely allied to I. acuminatus Swallen. The first glume is longer, the spikelets are larger (3.5-4 mm.), and do not have the long hairs that they do in I. acuminatus. These characters which seem to be enough to separate the two species now, may turn out to be only variables

of the same species when more material is available or studies are made in the field.

Venezuela: Carabobo: South side of Lake Valencia, Chase 12340. Aragua: Parque Nacional, Chase 12463.

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MATERIALS TOWARD A MONOGRAPH OF THE GENUS VERBENA. XXIV

Harold N. Moldenke

VERBENA RIGIDA Spreng.

Verbena venosa f. umbrosa is based on a collection made by Cornelius Osten (no. 11637) in shady places on rocky hills at Solis, in the Sierra Animas, department of Maldonado, Uruguay, between November 20 and 24, 1917, and is deposited in the herbarium of the Museo de Historia Natural at Montevideo. It has greatly elongated internodes and is apparently a shade form. Verbena venosa f. genuina is based on Osten 11636 from hedges at the same locality, collected at the same time, and deposited in the same herbarium. Verbena venusta is based on a collection made by C. J. Meyer in July, 1897, at Munich, Germany, deposited in the herbarium of the University of Michigan; V. nervosa Link is based on Herb. Hort. Matrit. 33, collected from cultivated material in Spain and deposited in the herbarium of the Jardin Botanico at Madrid; and V. scabrosa is based on a collection made by Joseph Hicks Pyron at the old reservoir in Clarke County, Georgia, on July 4, and is deposited in the herbarium of Duke University. I know nothing of V. venosa var. parviflora except what is said of it by Hegi (1927): "auf Schutt beim Friedhof von Mannheim [1913]."

The species is apparently native from central Brazil south to northern Argentina, but has been introduced and become naturalized in Chile, the West Indies, Mexico, Costa Rica, the southern United States, the Azores, Madeira, the Canary Islands, England, Sweden, South Africa, India, the Pacific islands, and Australia, blooming practically throughout the year. It is widely cultivated in many parts of North and South America, the West Indies, Europe, Java, and Hawaii, introduced into cultivation in 1830. Laplace says "introduit en 1839 [in France], originaire de La Plata". Mattoon (1958) states that it is offered to the horticultural trade by Georges Delbard, Watkins & Simpson (London), Hillier & Sons (Winchester), La Germinadora, Unwin, Vaughan's (New York and Chicago), Sutton & Sons (Reading), Thompson & Morgan, Hurst & Son (London), John Forbes (Hawick), and Pearce (Moorestown, New Jersey).

It is a very showy plant, especially when forming large patches of brilliant purple, as I personally observed it in Brazil and in the southern United States. The typical form has